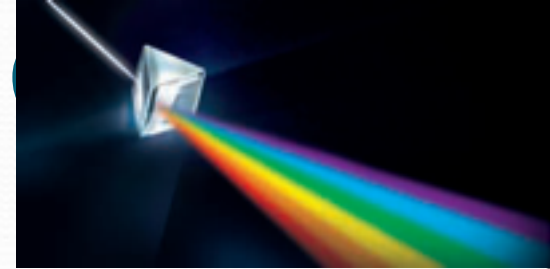


Light and the Electromagnetic Spectrum



1. What is light?
2. What kinds of light are there?
3. What are some important uses of light?
4. What are the main colours of light?
5. What can light do?

What Is White Light Made



- **Purpose**
- To observe the components of white light
- **Procedure**
- 1. Set the prism upright on the desk so that the rectangular sides are vertical.
- 2. Place the ray box about 20 cm away from the prism so that the ray shines on the prism.
- 3. Slowly rotate the prism. Observe the direction of light that emerges from the prism.
- 4. Hold a piece of white paper in the path of the light emerging from the prism about 50 cm away from the prism. Observe.
- 5. If you do not see anything interesting, try rotating the prism again.



With the people at your desk list the human activities in order from the smallest EM waves used to the largest EM waves.

Sun tanning

Reheating food for lunch

Using the classroom clickers

Watching fireworks

Getting a broken arm look at by the doctor

Listening to the stereo

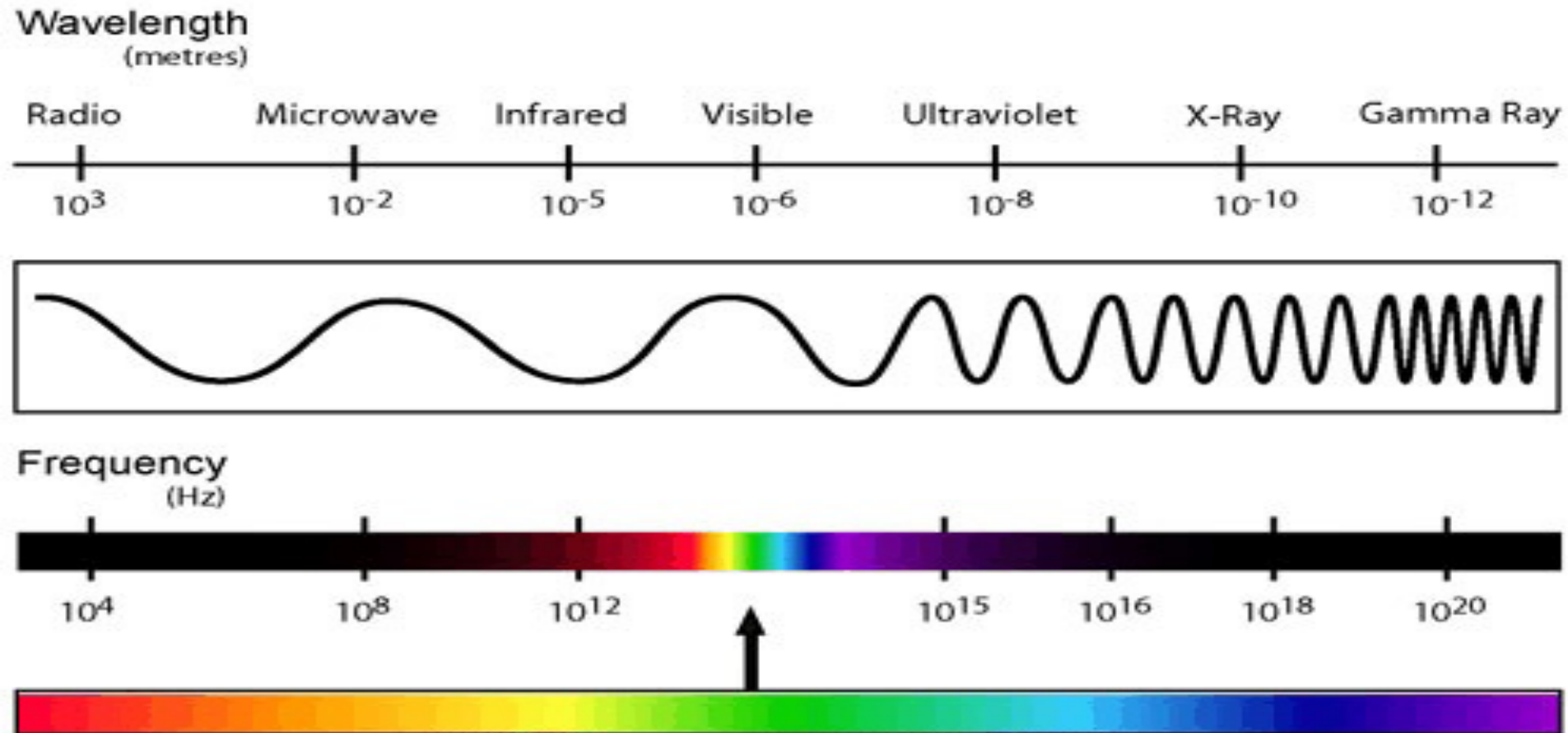
Getting exposed to nuclear radiation

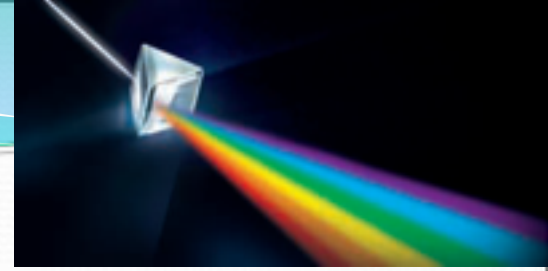
Warming up to a heat lamp in the bathroom



The Electromagnetic Spectrum

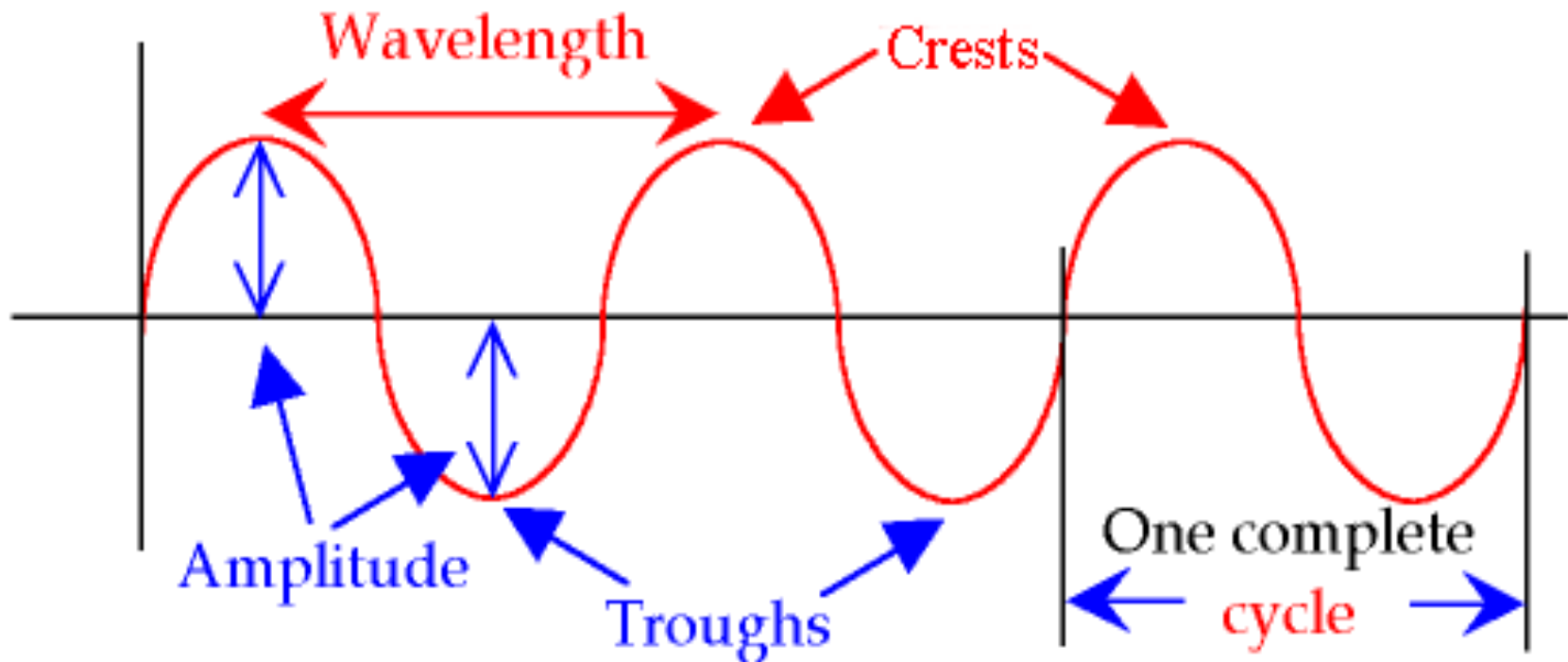
THE ELECTRO MAGNETIC SPECTRUM





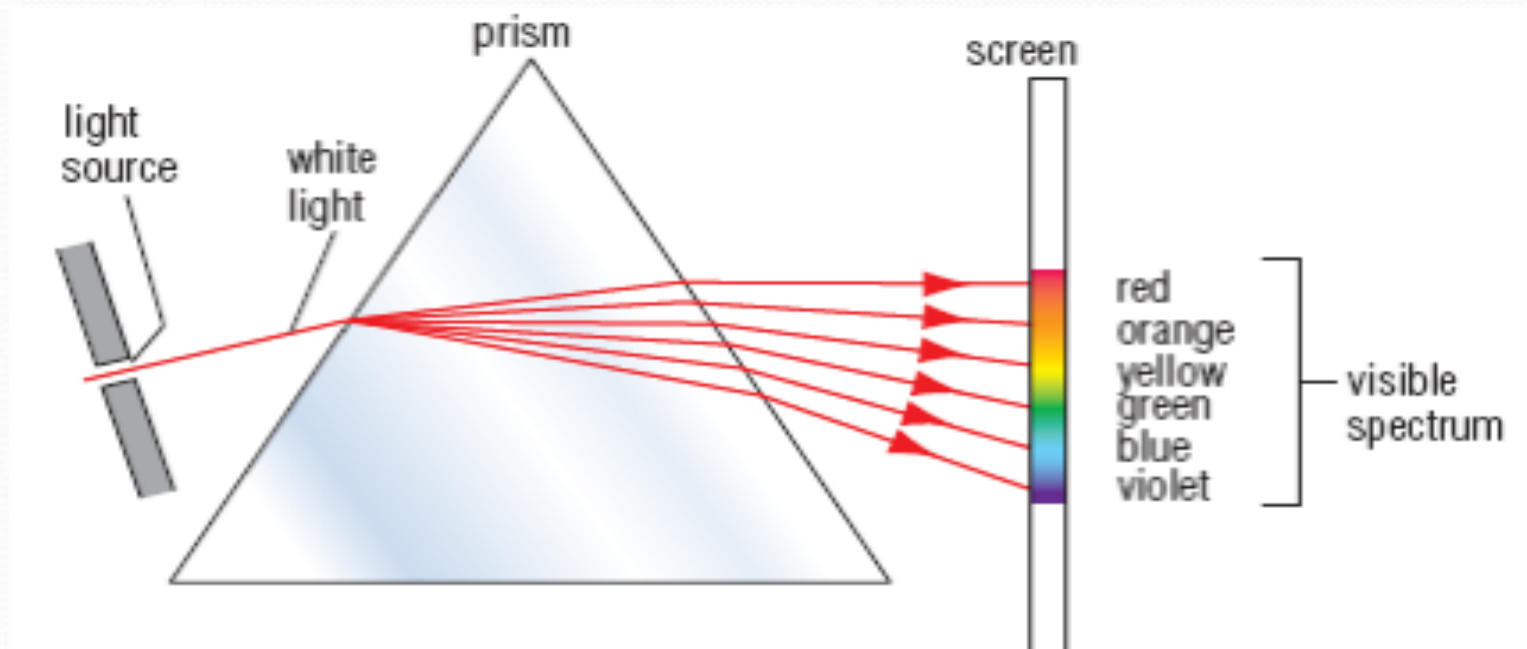
Properties of Waves

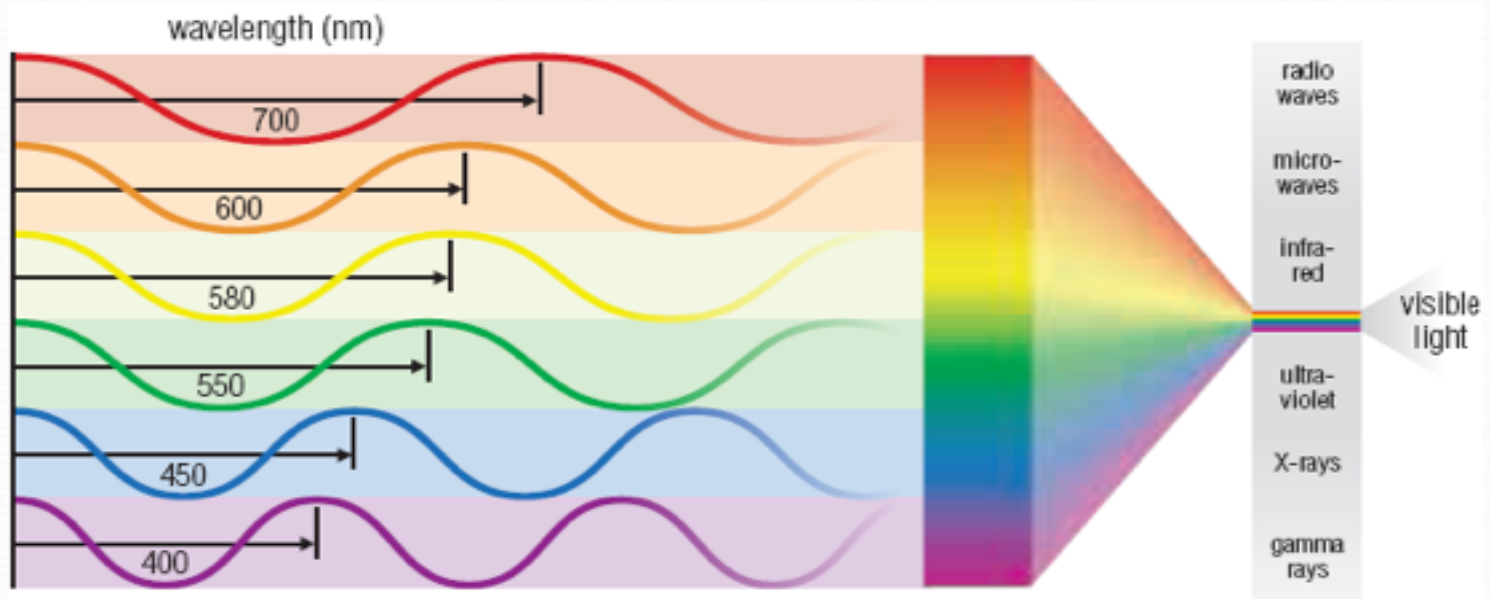
This wave is moving
in this direction



The Wave Model of Light

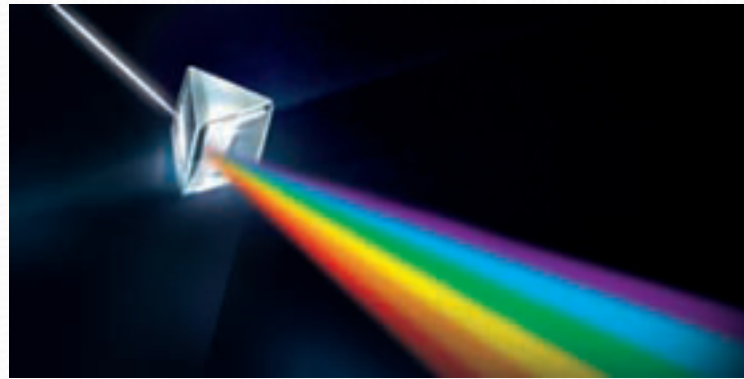
- white light separates into the colours red, orange, yellow, green, blue, and violet (ROY G BV).
- The range of different colours of light is called the **visible spectrum**. (seen by the eye).



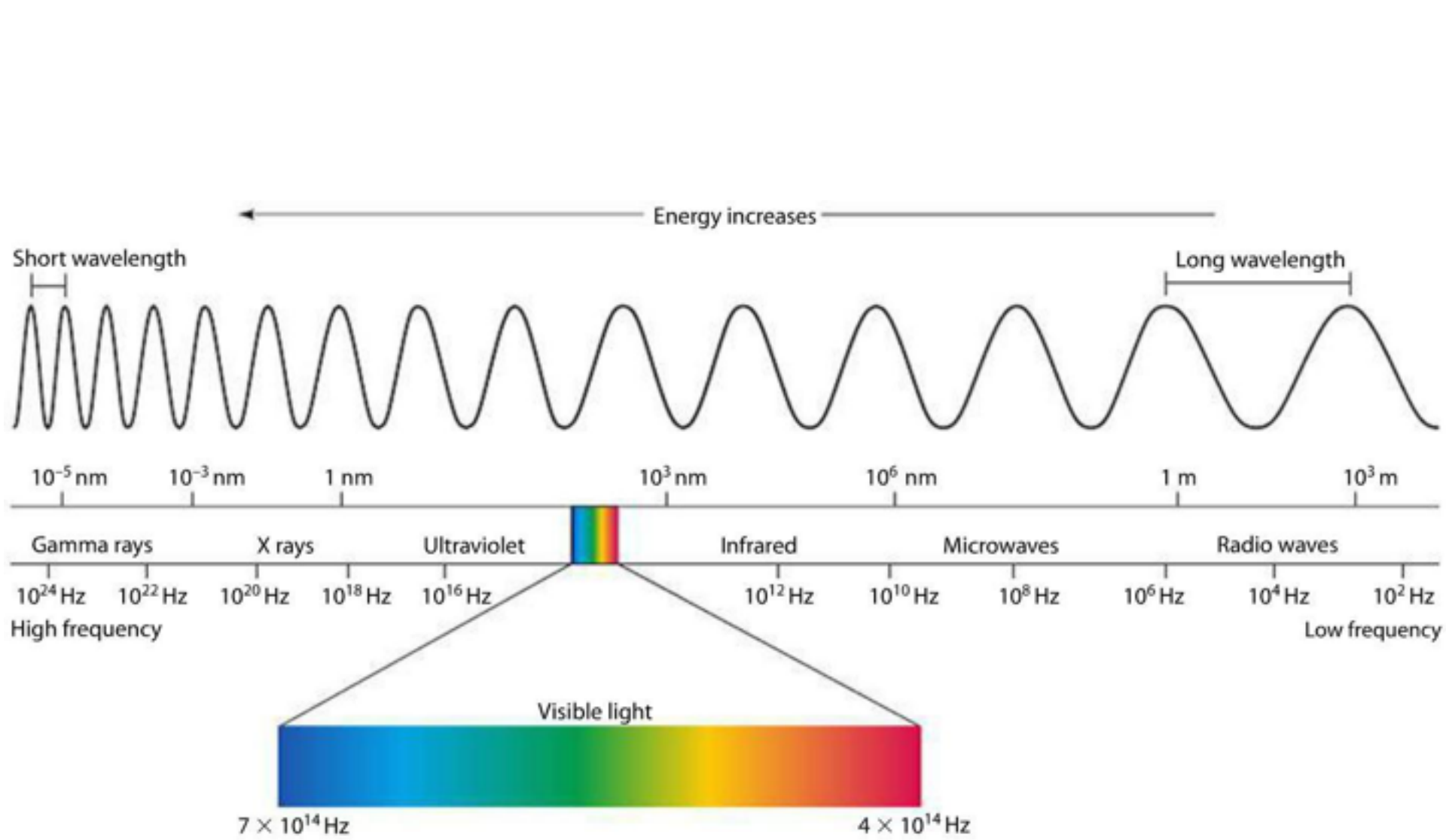


Light and Colour

- White light is composed of all the colours of the rainbow.



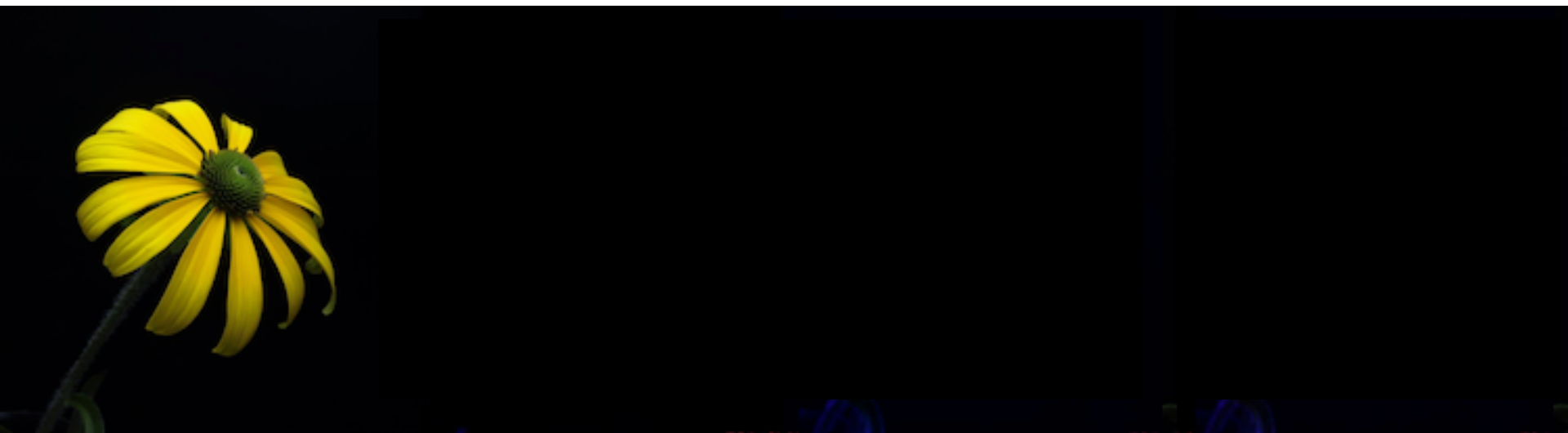
- A prism proves that **white** light is made up of multiple colours



Human

Bee

Bird



Human



Bee

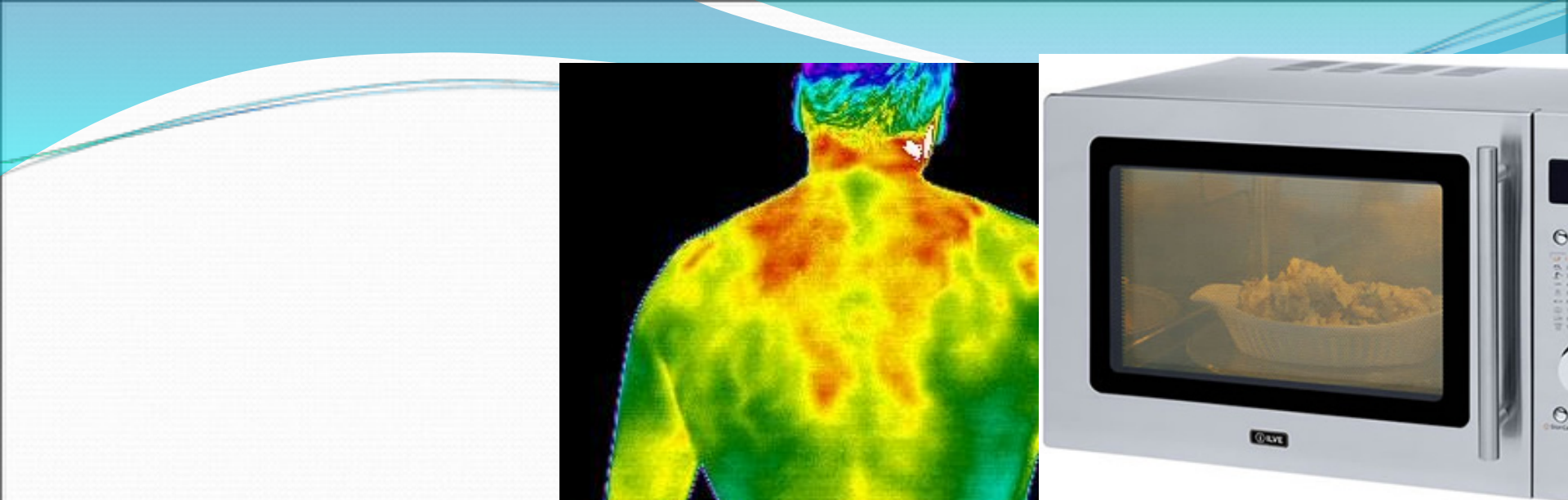




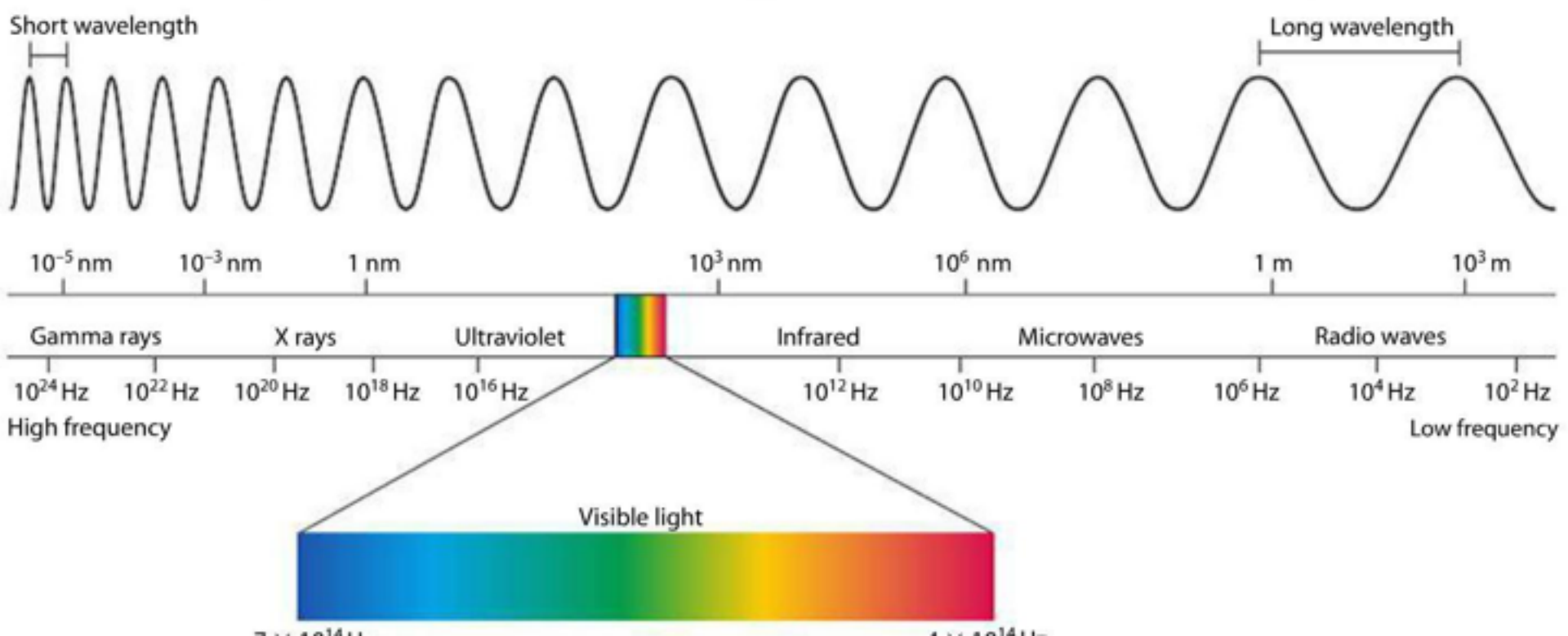
Human



Dog



← Energy increases →





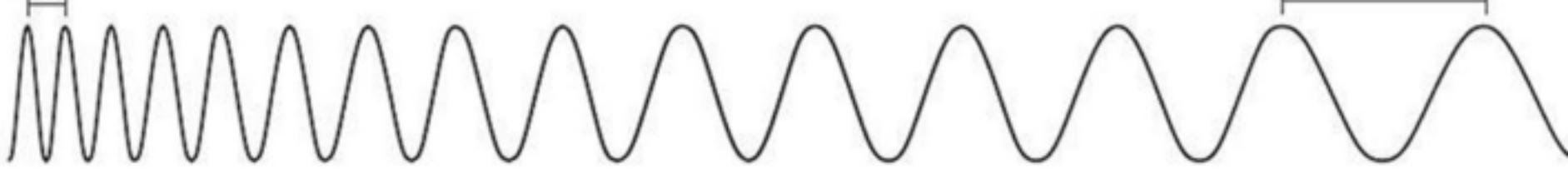
SCIENCEPHOTOLIBRARY



← Energy increases →

Short wavelength

Long wavelength



10^{-5} nm 10^{-3} nm 1 nm 10^3 nm 10^6 nm 1 m 10^3 m

Gamma rays X rays Ultraviolet Infrared Microwaves Radio waves

10^{24} Hz 10^{22} Hz 10^{20} Hz 10^{18} Hz 10^{16} Hz 10^{12} Hz 10^{10} Hz 10^8 Hz 10^6 Hz 10^4 Hz 10^2 Hz

High frequency

Low frequency

Visible light

